

AF/2813  
JFW

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

THEODORE W. HOUSTON

Serial No. 10/007,839 (TI-23546)

Filed November 8, 2001

For: MEANS FOR FROMING SOI

Art Unit 2813

Examiner Laura M. Shillinger

Customer No. 23494

**CERTIFICATE OF MAILING OR TRANSMISSION UNDER 37 CFR 1.8**

I hereby certify that the attached document is being deposited with the United States Postal Service with sufficient postage for First Class Mail in an envelope addressed to Director of the United States Patent and Trademark Office, P.O. Box 1450,, Alexandria, VA 22313-1450 or is being facsimile transmitted on the date indicated below:

8-5-05

Jay M. Cantor, Reg. No. 19,906

Director of the United States  
Patent and Trademark Office  
P. O. Box 1450  
Alexandria, VA 22313-1450

**PETITION FOR ACTION OR EXPLANATION OF NON-ACTION**

Sir:

Applicant, through his attorney, hereby petitions the Commissioner for Patents to provide an appropriate action or provide a reason for non-action in the subject application. No fee is believed to be due, however, should a fee be due, please charge to Deposit Account No. 20=0668.

The facts are that a Brief on Appeal (copy attached) was filed January 30, 2003 as evidenced by the attached copy of the PTO mail room receipt. Nothing has been received from the Patent and Trademark Office since. The Transaction History of the PTO website does not list any papers subsequent to the filing of the Notice of Appeal. A Status Request was mailed April 21, 2004 (copy attached) and no response thereto has been received either.

It is therefore apparent that a Brief on Appeal has been timely filed and apparently lost or misplaced by the PTO. Accordingly, appropriate action is respectfully requested.



Respectfully submitted,

Jay M. Cantor  
Attorney for Applicant(s)  
Reg. No. 19,906

Texas Instruments Incorporated  
P. O. Box 655474, MS 3999  
Dallas, Texas 75265  
(301) 424-0355 (Phone)  
(972) 917-5293 (Phone)  
(301) 279-0038 (Fax)



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

THEODORE W. HOUSTON

Serial No. 10/007,839 (TI-23546)

Filed November 8, 2001

For: MEANS FOR FROMING SOI

Art Unit 2813

Examiner Laura M. Shillinger

Customer No. 23494

Director of the United States  
Patent and Trademark Office  
P. O. Box 1450  
Alexandria, VA 22313-1450

**CERTIFICATE OF MAILING OR TRANSMISSION UNDER 37 CFR 1.8**

I hereby certify that the attached document is being deposited with the United States Postal Service with sufficient postage for First Class Mail in an envelope addressed to Director of the United States Patent and Trademark Office, P.O. Box 1450,, Alexandria, VA 22313-1450 or is being facsimile transmitted on the date indicated below:

\_\_\_\_\_  
Jay M. Cantor, Reg. No. 19,906

**STATUS REQUEST**

Sir:

Request is hereby made as to the status of the subject application.

The facts are that a Brief on Appeal was filed January 30, 2003 as evidenced by the attached copy of the PTO mail room receipt. Nothing has been received since. Accordingly, please advise as to the status of the subject application.

Respectfully submitted,

Jay M. Cantor  
Attorney for Applicant(s)  
Reg. No. 19,906

Texas Instruments Incorporated  
P. O. Box 655474, MS 3999  
Dallas, Texas 75265  
(301) 424-0355 (Phone)  
(972) 917-5293 (Phone)  
(301) 279-0038 (Fax)

Inventor(s): THEODORE W. HOUSTON

Serial No: 10/007,839

Filed: November 8, 2001

For: MEANS FOR FORMING SOI

Docket number: TI-23546



The following has been received in the United States Patent and Trademark Office on the date stamped:

**BRIEF ON APPEAL IN TRIPLICATE. (FEES  
CHARGED TO DEPOSIT ACCOUNT 20-0668).**

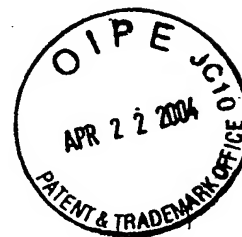
Date: January 30, 2003

Initials: JMC/bhr

On the date stamped here, the following paper was received in the Patent and Trademark Office in the below listed application:

Status Request

Inventor(s): Theodore W. Houston  
Serial No. 10/007,839  
Filed November 8, 2001  
For: MEANS FOR FORMING SOI  
Docket Number: TI-23546





IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

THEODORE W. HOUSTON

Serial No. 10/007,839 (TI-23546)

Filed November 8, 2001

For: MEANS FOR FORMING SOI

Art Unit 2813

Examiner Laura M. Schillinger

Commissioner for Patents  
Washington, D. C. 20231

Sir:

**BRIEF ON APPEAL**

**REAL PARTY IN INTEREST**

The real party in interest is Texas Instruments Incorporated, a Delaware corporation with offices at 7839 Churchill Way, Dallas, Texas 75251.

**RELATED APPEALS AND INTERFERENCES**

There are no known related appeals and/or interferences.

**STATUS OF CLAIMS**

This is an appeal of claims 1 to 14, all of the rejected claims. No claims have been allowed. Please charge any costs to Deposit Account No. 20-0668.

**STATUS OF AMENDMENTS**

An amendment was not filed after final rejection.

### SUMMARY OF INVENTION

The invention relates to a method of forming a semiconductor-on-insulator structure and the product of the process. The steps of the method require initially forming a structure having porous semiconductor material at a first surface thereof and sealing the surface. An epitaxial semiconductor layer is formed on the porous semiconductor material after the sealing step and an oxidizing species is implanted through the epitaxial layer into the porous semiconductor material. The oxidizing species is then reacted with the porous semiconductor material to form a buried dielectric layer beneath the epitaxial layer. The oxidizing species is preferably essentially oxygen and the semiconductor layer is preferably essentially silicon. The sealing step is preferably by heating in a hydrogen ambient.

### ISSUE

The sole issue on appeal is whether claims 1 to 14 are anticipated by Blewer et al. (U.S. 5,023,200) under 35 U.S.C. 102(b).

### GROUPING OF CLAIMS

The claims do not stand or fall together for reasons set forth hereinbelow under ARGUMENT.

### ARGUMENT

Claims 1 to 14 were rejected under 35 U.S.C. 102(b) as being anticipated by Blewer et al. (U.S. 5,023,200). The rejection is without merit.

In order for a rejection under 35 U.S.C.102(b) to be viable, each and every feature of the claim must be found in Blewer et al. This is clearly not the case as will be demonstrated hereinbelow.

Each of claims 1, 4 and 6 requires the step of sealing the surface. No such step is taught or suggested by Blewer et al. either alone or in the total combination as claimed. The final rejection now states that this feature is found at column 4, lines 19 to 22, stating that "densification of the oxidized porous silicon - this densification acts to seal the OPS layer from subsequent HF etching". The allegation that densification is the equivalent of sealing is mere speculation on the part of the examiner and clearly not stated as sealing in Blewer. The fact that a substance is densified does not equate to sealing. In fact, the very section of Blewer cited by the examiner clearly states that the purpose of the densification is to adjust the etch rate of the glass. This has nothing whatsoever to do with sealing or an allegation that the densified glass is used as a sealant.

Each of claims 1, 4 and 6 further requires the step of implanting an oxidizing species through the epitaxial layer into the porous semiconductor material. No such step is taught or suggested by Blewer et al. either alone or in the total combination as claimed in conjunction with the method of Blewer et al. or that of the subject application. In this regard, the final rejection states that this step is found at column 1, lines 30 to 45. The material referred to relates to the prior art implantation of oxygen in SIMOX, this has nothing to do with implantation of oxidizing species into porous semiconductor material. Clearly, there is no teaching or suggestion in Blewer et al. to perform this step either alone or in the total combination as claimed to provide a buried oxide layer in porous silicon. Also, for this reason alone, Blewer et al. fails to anticipate any of the claims on appeal..



Claims 2, 3 and 9 depend from claim 1, claims 5 and 10 depends from claim 4 and claims 7, 8 and 11 depend from claim 6 and therefore define patentably over Blewer et al. for at least the reasons presented above with reference to the claims from which these claims depend.

In addition, claim 2 further limits claim 1 by requiring that the oxidizing species consist essentially of oxygen. No such step is taught or suggested by Blewer et al. in the total combination as claimed.

Claim 3 further limits claim 1 by requiring that the semiconductor layer consist essentially of silicon. No such step is taught or suggested by Blewer et al. in the total combination as claimed.

Claim 5 further limits claim 4 by requiring that the semiconductor layer consist essentially of silicon. No such step is taught or suggested by Blewer et al. in the total combination as claimed.

Claim 7 further limits claim 6 by requiring that the oxidizing species consist essentially of oxygen. No such step is taught or suggested by Blewer et al. in the total combination as claimed.

Claim 8 further limits claim 6 by requiring that the semiconductor layer consist essentially of silicon. No such step is taught or suggested by Blewer et al. in the total combination as claimed.

Claims 12 to 14 further limit claims 1, 4 and 6 by requiring that the step of sealing include heating the porous semiconductor material in a hydrogen ambient. No such step is taught or suggested by Blewer et al. either alone or in the total combination as claimed.

### **CONCLUSIONS**

For the reasons stated above, reversal of the final rejection and allowance of the claims on appeal is requested that justice be done in the premises.

Respectfully submitted,



Jay M. Cantor  
Reg. No. 19906  
(202) 639-7713

## **APPENDIX**

The claims on appeal read as follows:

1. A method of forming a semiconductor-on-insulator structure, comprising the steps of:
  - a) forming a structure having porous semiconductor material at a first surface thereof;
  - b) sealing said surface;
  - c) forming an epitaxial semiconductor layer on said porous semiconductor material after said sealing;
  - d) implanting an oxidizing species through said epitaxial layer into said porous semiconductor material; andreacting said oxidizing species with said porous semiconductor material to form a buried dielectric layer beneath said epitaxial layer.
2. The method of Claim 1, wherein said oxidizing species consists essentially of oxygen.
3. The method of Claim 1, wherein said semiconductor layer consists essentially of silicon.

4. A method of forming a semiconductor-on-insulator structure, comprising the steps of:
  - a) anodizing a silicon wafer to form porous silicon;
  - b) sealing said surface;
  - c) forming a semiconductor layer on said porous silicon after said sealing;
  - d) implanting an oxidizing species through said epitaxial layer into said porous semiconductor material; and
  - e) reacting said oxygen with said porous semiconductor material to form a buried oxide layer.
5. The method of Claim 4, wherein said semiconductor layer consists essentially of silicon.
6. A method of forming a semiconductor-on-insulator structure, comprising the steps of:
  - a) partially anodizing a silicon wafer to form porous silicon; and thereafter
  - b) sealing said surface;
  - c) forming an epitaxial semiconductor layer on said porous silicon;
  - d) implanting oxygen into said porous silicon through said epitaxial semiconductor layer; and
  - e) reacting said oxygen with said porous silicon to form a buried oxide layer.
7. The method of Claim 6, wherein said oxidizing species consists essentially of oxygen.
8. The integrated circuit of Claim 6, wherein said semiconductor layer consists essentially of silicon.
9. A product made by the process of Claim 1.

10. A product made by the process of Claim 4.
11. A product made by the process of Claim 6.
12. The method of claim 1 wherein said step of sealing includes heating said porous semiconductor material in a hydrogen ambient.
13. The method of claim 4 wherein said step of sealing includes heating said porous semiconductor material in a hydrogen ambient.
14. The method of claim 6 wherein said step of sealing includes heating said porous semiconductor material in a hydrogen ambient.

Inventor(s): THEODORE W. HOUSTON

Serial No: 10/007,839

Filed: November 8, 2001

For: MEANS FOR FORMING SOI

Docket number: TI-23546



The following has been received in the United States Patent and Trademark Office on the date stamped:

**BRIEF ON APPEAL IN TRIPLICATE. (FEES  
CHARGED TO DEPOSIT ACCOUNT 20-0668).**

Date: January 30, 2003

Initials: JMC/bhr



## United States Patent and Trademark Office

[Home](#) | [Site Index](#) | [Search](#) | [FAQ](#) | [Glossary](#) | [Guides](#) | [Contacts](#) | [eBusiness](#) | [eBiz Alerts](#) | [News](#) | [Help](#)

## Portal Home

## Patent Applications

[Patent Application Information \(PAIR\)](#)[PAIR Frequently Asked Questions](#)[PAIR Help](#)[Search Class/Subclass/GAU](#)[Manual of Patent Classification](#)**Secure eBusiness**[Patent EBC](#)[Customer Numbers](#)[Digital Certificates](#)[Electronic Filing](#)[Private PAIR](#)[Glossary](#)[Patent eBusiness Support/Help](#)[System Alerts](#)[Viewer Download: PDF](#)

## Patent Information

[About Patents](#)[Manual of Patent Examining Procedure](#)[Patent Assistance Center](#)[Employee Locator Search](#)[Valid Location Codes](#)[Telephone Directory](#)[Fees](#)[Pay online \(RAM\)](#)[Inventor Resources](#)[News, Federal Register & OG Notices](#)[PTDL Program](#) - libraries near you[Registered Patent Attorneys & Agents](#)

## Patent Searches

[Search Patents/Patent Applications](#) - full text & images[How to View Patent Images](#)[Search Assignments](#) - ownership[Search International Patents](#)[Other Search Resources & Tips](#)[Sequence Searches](#) (biotech)[Software for Sequence Listings](#)[Order Copies & Publications](#)[Products & Services](#)

## Other

## Patent Application Information Retrieval

Select Search Method: Enter Number:

Application Number

SUBMIT

10/007,839 Means for forming SOI

Application Data	Transaction History	Image File Wrapper	Continuity Data	Published Documents	Publication Dates
Date	Content				
01-29-2003	Notice of Appeal Filed				
01-13-2003	Mail Notice of Restarted Respc				
01-13-2003	Letter Restarting Period for F				
12-17-2002	Mail Final Rejection (PTOL - 32				
12-16-2002	Final Rejection				
10-09-2002	Date Forwarded to Examiner				
09-30-2002	Appeal Brief Filed				
09-27-2002	Notice of Appeal Filed				
09-03-2002	Mail Final Rejection (PTOL - :				
08-30-2002	Final Rejection				
08-25-2002	Receipt of all Acknowledgem				
06-28-2002	Date Forwarded to Examiner				
06-25-2002	Response after Non-Final Ac				
05-22-2002	Mail Non-Final Rejection				
05-20-2002	Non-Final Rejection				
01-10-2002	Referred by L&R for Third-Leve Letter Generated				
11-08-2001	Preliminary Amendment				
02-14-2002	Case Docketed to Examiner in				
01-24-2002	Application Dispatched from				
01-23-2002	Application Is Now Complete				
01-08-2002	IFW Scan & PACR Auto Secu				
12-21-2001	IFW Scan & PACR Auto Securi				
11-08-2001	Initial Exam Team nn				

The Patent Electronic Business Center is available to assist with PAIF